

CLAIMS

We claim:

- Sub 5
A1
1. Apparatus to adapt a common telephone for operation as a speakerphone, comprising:
- a loudspeaker;
 - a microphone;
 - an audio module adapted for removable interfacing to a handset jack of a base unit of a telephone.
- 10
2. The apparatus to adapt a common telephone for operation as a speakerphone according to claim 1, further comprising:
- a power supply.
- 15
3. The apparatus to adapt a common telephone for operation as a speakerphone according to claim 2, wherein:
- said power supply is adapted to include a battery.
- 20
4. The apparatus to adapt a common telephone for operation as a speakerphone according to claim 1, wherein:
- said apparatus is adapted to be operated in a half-duplex mode.
- 25
5. The apparatus to adapt a common telephone for operation as a speakerphone according to claim 1, wherein:
- said apparatus is adapted to operate in a full-duplex mode.

6. The apparatus to adapt a common telephone for operation as a speakerphone according to claim 5, further comprising:
an audio echo canceler.

5 7. The apparatus to adapt a common telephone for operation as a speakerphone according to claim 6, wherein:
said audio echo canceler is an algorithm included in a digital signal processor.

10 8. The apparatus to adapt a common telephone for operation as a speakerphone according to claim 7, wherein said digital signal processor further includes:
a hybrid echo canceler.

15 9. The apparatus to adapt a common telephone for operation as a speakerphone according to claim 1, wherein said audio module comprises:

20 a first codec for converting a signal to and from said handset jack of said base unit of said telephone between analog and digital signals;

an echo canceler; and

a second codec for converting a signal to said loudspeaker and a signal from said microphone into respective analog and digital signals.

25 10. The apparatus to adapt a common telephone for operation as a speakerphone according to claim 9, wherein said echo canceler comprises:

30 an audio echo canceler.

11. The apparatus to adapt a common telephone for operation as a speakerphone according to claim 10, wherein said echo canceler further comprises:

a hybrid echo canceler.

5

12. The apparatus to adapt a common telephone for operation as a speakerphone according to claim 1, wherein:

said audio module is adapted and arranged for direct connection to said base unit of said telephone without use of a telephone line interface.

10

13. The apparatus to adapt a common telephone for operation as a speakerphone according to claim 1, further comprising:

a telephone line interface.

15

14. The apparatus to adapt a common telephone for operation as a speakerphone according to claim 1, further comprising:

a switch;

said switch having a first position which interconnects said handset to said handset jack of said telephone; and

20

said switch having a second position which interconnects said audio module to said handset jack of said telephone.

15. The apparatus to adapt a common telephone for operation as a speakerphone according to claim 1, further comprising:

25

a voice pager.

Sub
A2

16. A method of converting a common telephone into a speakerphone, comprising:

removing a handset connection between a handset and a base of a telephone; and

5 temporarily connecting a loudspeaker and a microphone to said handset connection on said base.

17. The method of converting a common telephone into a speakerphone according to claim 16, further comprising:

10 amplifying an output of said handset connection on said base.

18. The method of converting a common telephone into a speakerphone according to claim 17, wherein:

15 said amplifying is powered by battery.

19. The method of converting a common telephone into a speakerphone according to claim 16, further comprising:

20 disconnecting said loudspeaker and said microphone from said handset connection on said base; and
restoring said handset connection between said handset and said base of telephone.

Sub
A3

25 20. Apparatus for converting a common telephone into a speakerphone, comprising:

means for removing a handset connection between a handset and a base of said telephone; and

means for temporarily connecting a loudspeaker and a microphone to said handset connection on said base.

30

21. The apparatus for converting a common telephone into a speakerphone according to claim 20, further comprising:

means for amplifying an output of said handset connection on said base.

5

22. The apparatus for converting a common telephone into a speakerphone according to claim 21, wherein:

said means for amplifying is powered by battery.

10

23. The apparatus for converting a common telephone into a speakerphone according to claim 20, further comprising:

means for disconnecting said loudspeaker and said microphone from said handset connection on said base; and

15

means for restoring said handset connection between said handset and said base of said telephone.

24. A communication device, comprising:

a voice pager including a speaker;

a microphone;

20

an external handset cord adapter; and

an audio echo canceler adapted for operation when said communication device is connected to a telephone through said external handset cord adapter;

25

said communication device having a voice paging mode of operation and a speakerphone mode of operation.

25. The communication device according to claim 24,
wherein:

said voice pager including said speaker is adapted for operation when said communication device is in said voice paging mode of operation; and

said microphone, said audio echo canceler, and said speaker of said voice pager are adapted for operation when said communication device is in said speakerphone mode of operation.

10

16